PATENT ABSTRACTS OF JAPAN

(11)Publication number : 08-278157

(43)Date of publication of application : 22.10.1996

(51)Int.Cl. G01C 21/00
G08G 1/0969
G09B 29/00

(21)Application number : 07-107931

(22)Date of filing : 06.04.1995

(71)Applicant : AQUEOUS RES:KK
AISIN AW CO LTD

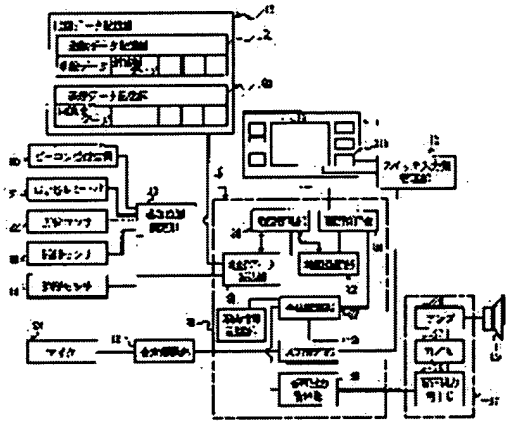
(72)Inventor : YOKOYAMA SHOJI
MIKI NOBUAKI
KUSAFUKA MUNEO
MURASE YOSHITAKA

(54) NAVIGATION SYSTEM

(57)Abstract:

PURPOSE: To search and guide a travelable route according to the type and form of a vehicle.

CONSTITUTION: At least one item of those data of the full length, width, height, gross weight in time of normal traveling, a minimal turning radius and gradability of a vehicle is stored in a vehicle information storage part 38 as vehicle information. An overall control part 37 extracts travelable road on the basis of the vehicle information obtained from the vehicle information storage part 38 and road data stored in a road data storage part 151 of a map data storage part 15, and it performs its duty for route searching and route guidance with this extracted travelable road.



LEGAL STATUS

[Date of request for examination] 12.12.2001

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]
[Claim 1] Navigation equipment characterized by providing the following. It is an input means in order to input information including a destination. A storage means to memorize path planning and a traffic information required for path guidance A vehicles information acquisition means to acquire vehicles information required to extract a road it can run A path-planning means search for the path to the destination were inputted by said input means, using the road which extracted and extracted the road it can run based on a traffic information memorized by vehicles information acquired by this vehicles information acquisition means, and said storage means and which can be run, and a path guidance means perform path guidance according to the path for which it was searched by this path-planning means
[Claim 2] Navigation equipment according to claim 1 characterized by providing further a display means to display only a road which extracted and extracted a road it can run based on a traffic information memorized by vehicles information acquired by said vehicles information acquisition means, and said storage means.
[Claim 3] Vehicles information acquired with said vehicles information acquisition means is an overall length of vehicles, full, an overall height, and navigation equipment according to claim 1 or 2 characterized by usually including at least one of AUW at the time of transit, a minimum turning radius, and climb engine performance.

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] This invention responds to vehicles and relates to the navigation equipment to which it searches for and shows the path it can run.
[0002]
[Description of the Prior Art] In recent years, development of the navigation equipment which performs path guidance geographically to the destination to an unfamiliar operator is performed briskly. With this navigation equipment, if the destination and an origin are inputted, it searches for the transit path of the automobile between both this point, and path guidance will be performed, displaying on a display the arrow head which shows the current position of these transit path and vehicles, and a travelling direction with a road map.
[0003]
[Problem(s) to be Solved by the Invention] However, with conventional navigation equipment, path planning and path guidance were similarly performed irrespective of the difference of the overall length of vehicles, full, an overall height, weight, etc. Therefore, there was a trouble that a path impossible [transit] or unsuitable may be guided by navigation equipment depending on a type of a car. For example, with conventional navigation equipment, if the destination is the same as the current position, since the same path will be guided with a heavy-duty truck and a light car, the case where there are a road which has limits, such as an overall length of vehicles, full, an overall height, and weight, while being a path, a tunnel, a pons, etc., and the case where it is said with a heavy-duty truck that transit is impossible although it could run in the light car when there is a steep corner of a street arise.
[0004] Then, the purpose of this invention is to respond to vehicles and offer the navigation equipment to which it can search for and show the path it can run.
[0005]
[Means for Solving the Problem] In order that invention according to claim 1 may input information including a destination, an input means, A storage means to memorize path planning and a traffic information required for path guidance, and a vehicles information acquisition means to acquire vehicles information required to extract a road which can be run, A road it can run is extracted based on a traffic information memorized by vehicles information acquired by this vehicles information acquisition means, and storage means. Navigation equipment is made to possess a path planning means to search for a path to a destination in which it was inputted by input means, and a path guidance means to perform path guidance according to a path for which it was searched by this path planning means, using an extracted road which can be run, and said purpose is attained. Invention according to claim 2 possesses further a display means to display only a road which extracted and extracted a road it can run based on a traffic information memorized by vehicles information acquired by vehicles information acquisition means, and storage means, in navigation equipment according to claim 1. In navigation equipment according to claim 1 or 2, vehicles information acquired with a vehicles information acquisition means constitutes invention according to claim 3 so that at least one of an overall length of vehicles, full, an overall height, AUW at the time of usual transit, a minimum turning radius, and climb engine performance may be included.
[0006]
[Function] With navigation equipment according to claim 1, path planning and a traffic information required for path guidance are memorized by the storage means, and vehicles information required to extract the road it can run with a vehicles information acquisition means is acquired. And the road it can run is extracted by the path-planning means based on the traffic information memorized by the vehicles information acquired by the vehicles information acquisition means, and the storage means, it is searched for the path to the destination in_which of it was inputted by the input means, using the road in which this extracted transit is possible, and path guidance is performed by the path

guidance means according to this path. With navigation equipment according to claim 2, by the display means, the road it can run is extracted based on the traffic information memorized by the vehicles information acquired by the vehicles information acquisition means, and the storage means, and only this extracted road is displayed. With navigation equipment according to claim 3, at least one of the overall length of vehicles, full, an overall height, the AUW at the time of usual transit, a minimum turning radius, and climb engine performance is gained as vehicles information by the vehicles information acquisition means.

[0007]

[Example] The suitable example in the navigation equipment of this invention is explained to details with reference to drawing 1 and drawing 2 below. Drawing 1 is the block diagram showing the configuration of the navigation equipment concerning one example of this invention. This navigation equipment is equipped with operation part 10. To this operation part 10 The display 11 containing switch 11b for actuation prepared in the perimeter of display 11a which functions as a touch panel, and this display 11a, The switch input Management Department 12 which manages the input from the touch panel of this display 11 or switch 11b, the current position test section 13, the speed sensor 14, the map data storage section 15, the speech recognition section 16, and the voice output section 17 are connected.

[0008] The current position test section 13 is detecting the coordinate data based on the LAT and LONG, and detects the current position which vehicles have stopped [which has stopped and has current-run]. The GPS (Global Position System) receiver 21 which measures the location of vehicles using a satellite, the beacon receiving set 20 which receives the positional information from the beacon arranged in the road, the bearing sensor 22, and a distance robot 23 are connected to this current position test section 13, and the current position test section 13 measures the current position of vehicles using the information from these.

[0009] The bearing sensor 22 For example, the earth magnetism sensor which detects earth magnetism and asks for bearing of vehicles, The gas rate gyro which detects the angular rate of rotation of vehicles, integrates with the angular velocity, and asks for bearing of vehicles, The wheel sensor which computed the amount of displacement of bearing by arranging gyroscopes, such as an optical fiber gyroscope and an oscillating gyroscope, and a wheel sensor on either side, and detecting revolution of vehicles according to the output pulse difference (difference of migration length) is used. Various kinds of methods, such as that with which a distance robot 23 detects and carries out counting of the rotational frequency of a wheel, or detects acceleration, and it integrates twice, are used. In addition, although location measurement is independently possible for the GPS receiver 21 and the beacon receiving set 20, in the location in which reception by the GPS receiver 21 or the beacon receiving set 20 is impossible, the current position is detected with the bearing sensor 22 and the dead-reckoning navigation which used the both sides of a distance robot 23.

[0010] The map data storage section 15 is equipped with the indicative-data storage section 152 which memorized the road data storage section 151 which memorized path planning and road data required for path guidance, and an indicative data. The road data which is data, such as a crossing used for path retrieval, a node, and a road, is stored in the road data storage section 151. Road data contains various data, such as whenever [lane / which accompanies each road /, width-of-street, clearance, load-limits, radius-of-curvature / of a corner of a street / and tilt-angle]. The data of the background of the destination data which is data of the selectable destination displayed on a map with a road, the building displayed on a map with a road, a means of transportation, a river, etc., etc. is stored in the indicative-data storage section 152.

[0011] The microphone 24 for inputting voice is connected to the speech recognition section 16. The voice output section 17 is equipped with IC26 for voice outputs which outputs voice as a digital signal, D/A converter 27 which carries out digital to analog conversion of the output of this IC26 for voice outputs, and the amplifier 28 which amplifies the output of this D/A converter 27. The loudspeaker 29 is connected to the outgoing end of amplifier 28.

[0012] The map data reading section 31 which reads the data which operation part 10 was connected to the speed sensor 14 and the map data storage section 15, and was memorized by the map data storage section 15, The map drawing section 32 which draws a map using the data memorized by the map data storage section 15, With the map Management Department 33 which manages the map data reading section 31 and the map drawing section 32 The screen management section 34 which is connected to the map drawing section 32 and a display 11, and manages the screen of display 11a, With the input Management Department 35 which is connected to the switch input Management Department 12 and the speech recognition section 16, and manages an input With the voice output Management Department 36 which is connected to IC26 for voice outputs of the voice output section 17, and manages a voice output It has the vehicles information storage section 38 which memorizes vehicles information required to extract the road it can run, and the whole Management Department 37 which manages the map Management Department 33, the screen management section 34, the input Management Department 35, the voice output Management Department 36, and the vehicles information storage section 38.

[0013] At least one of the overall length of vehicles, full, an overall height, the AUW at the time of usual transit, a

minimum turning radius, and climb engine performance is memorized as vehicles information by the vehicles information storage section 38. Vehicles information may be beforehand memorized by the vehicles information storage section 38, and a user inputs it with voice using a hand or a microphone 24 using the touch panel of a display 11, or switch 11b, and may be made to memorize it in the vehicles information storage section 38. Operation part 10 realizes each above-mentioned configuration by having CPU (central processing unit), ROM (read only memory), RAM (random access memory), etc., and performing the program in which CPU was stored in ROM by making RAM into working area.

[0014] Next, with reference to the flow chart of drawing 2 , actuation of the navigation equipment concerning this example is explained. A user inputs the destination with voice first using a hand or a microphone 24 using the touch panel of a display 11, or switch 11b (step 101). The information inputted using a touch panel or switch 11b is inputted into the whole Management Department 37 through the switch input Management Department 12 and the input Management Department 35. The information inputted by voice using the microphone 24 is recognized in the speech recognition section 16, and is inputted into the whole Management Department 37 through the input Management Department 35.

[0015] Next, the whole Management Department 37 gains the current position measured by the current position test section 13 through the map Management Department 33 (step 102), and acquires vehicles information from the vehicles information storage section 38 (step 103). Next, the whole Management Department 37 reads the road data of the current position measured from the current position test section 13, and area including the destination from the road data storage section of the map data storage section 15 (step 104). Based on the vehicles information acquired from the road data and the vehicles information storage section 38 of area including the current position and the destination, it searches for the path from the current position to the destination using the road which extracted and (step 105) extracted the road it can run and which can be run (step 106).

[0016] Next, the whole Management Department 37 makes the map drawing section 32 draw the map of a range including the path which controlled and looked for the map Management Department 33, and displays only the road which extracted this map as a road at this time although the screen management section 34 is controlled and was displayed on display 11a and which can be run (step 107). Next, by voice guidance outputted from the map displayed on display 11a, or the voice output section 17, the whole Management Department 37 performs path guidance according to the path for which it searched (step 108), and ends actuation.

[0017] Since it was made having performed path planning and path guidance using the road which extracted and extracted the road it can run according to vehicles and which can be run based on the road data memorized by the road data-storage section 151 of vehicles information and the map data-storage section 15 gained from the vehicles information-storage section 38 according to this example as having explained above, it can respond to vehicles, and the path it can run can search for and guide. Moreover, since only the extracted road which can be run was displayed on display 11a, it becomes easy for an operator to recognize a path.

[0018] This invention is not limited to the above-mentioned example. In addition, only not only in the time of path guidance In order to display the current position for a destination input, also in case a map is displayed on display 11a You may make it display only the road which extracted and extracted the road it can run according to vehicles and which can be run on display 11a based on the road data memorized by the road data storage section 151 of vehicles information and the map data storage section 15 gained from the vehicles information storage section 38. Moreover, only the extracted road which can be run is not displayed on display 11a, but you may make it display all the roads that can be displayed on display 11a at the time of path guidance. Moreover, it searches for the path which inputs the upper limit of whenever [tilt-angle] apart from the original climb engine performance as vehicles information, or inputs the upper limit of the altitude since it may be more efficient to have bypassed the mountain path and to run rather than it runs a mountain path in the case of an electric vehicle and consumes a battery too much, and bypasses a mountain path to navigation equipment, and you may make it make it show around.

[0019]

[Effect of the Invention] As explained above, according to navigation equipment given in any 1 claim of claim 1 to claim 3 With a vehicles information acquisition means, vehicles information required to extract the road it can run is acquired. With a path planning means The road it can run is extracted based on the traffic information memorized by the vehicles information acquired by the vehicles information acquisition means, and the storage means. Since path planning is performed and the path guidance means was made to perform path guidance according to this path for which it searched using the road in which this extracted transit is possible, it can respond to vehicles, and the path it can run can be searched for and guided. Moreover, since only the extracted road which can be run was displayed according to navigation equipment according to claim 2, in addition to the above-mentioned effect, it becomes easy for an operator to recognize a path.

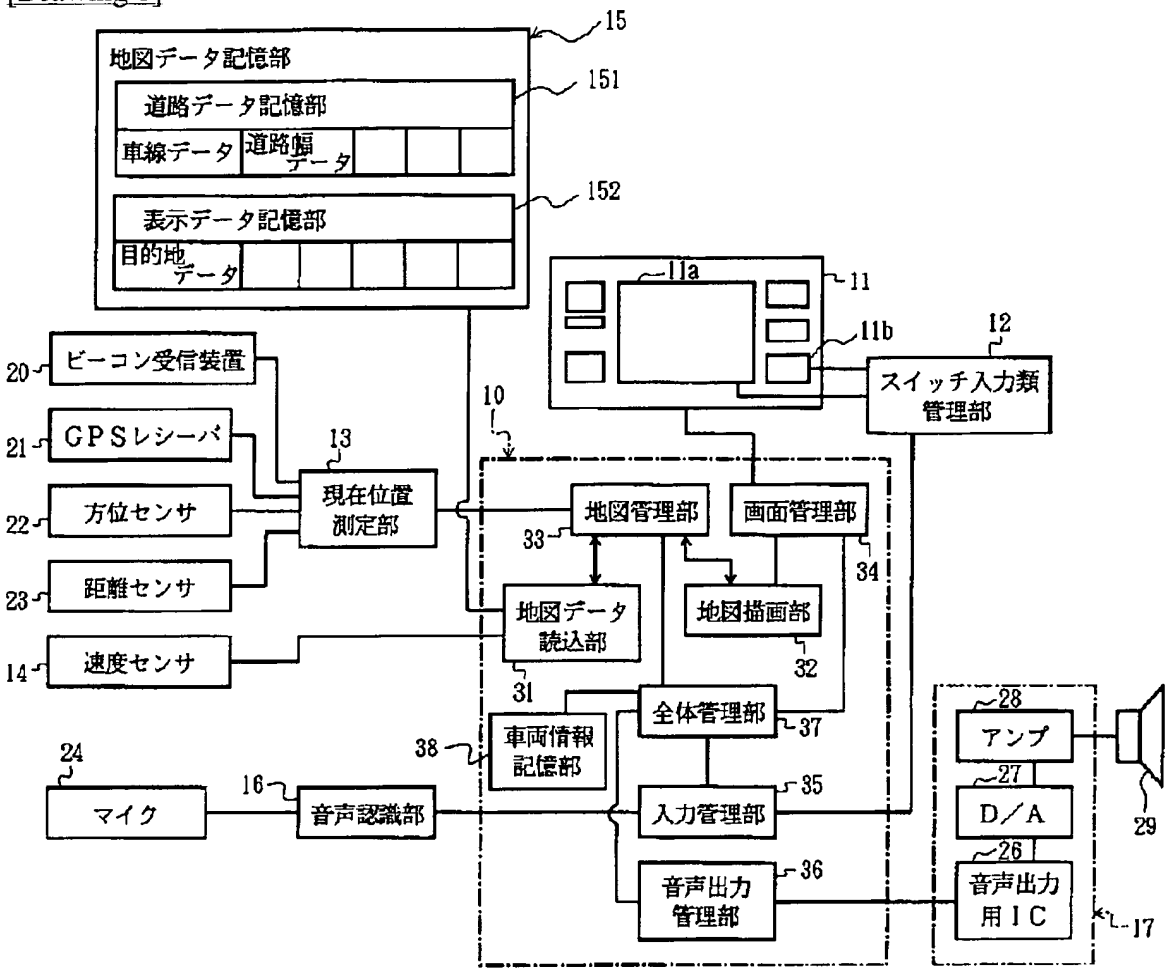
[Translation done.]

* NOTICES *

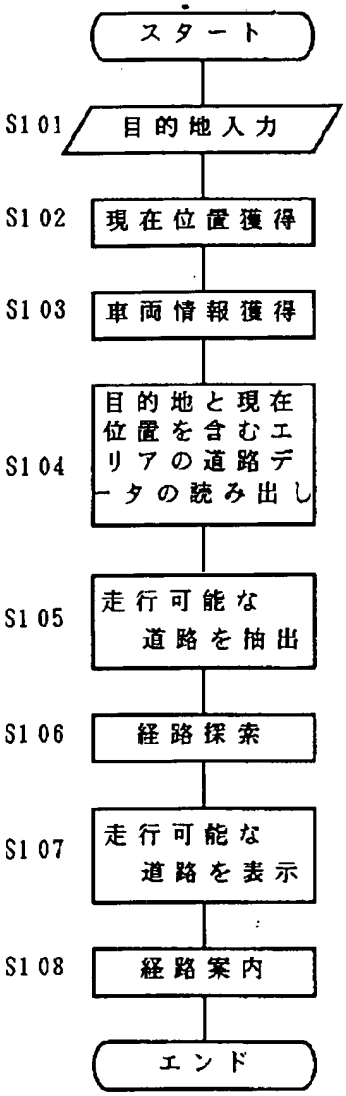
1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DRAWINGS

[Drawing 1]



[Drawing 2]



[Translation done.]